

Lindane Summary

Uses

- Lindane is a broad spectrum insecticide registered for agricultural use as a pre-plant seed treatment on 6 crops: barley, corn, oats, rye, sorghum, and wheat. The lindane reregistration risk assessments also consider a pending new use registration for canola (seed treatment only). The canola data are included for informational purposes. The determination on the new use will be made as a registration action.
- Seed treatment with lindane may occur at either seed treating facilities or alternately, it may be applied on-farm prior to planting.
- Application to seed occurs at a rate of 0.031 to 0.125 lbs of lindane/100 lbs of seed. (Canola at 1.5 lbs/100 lbs of seed.)
- Up to 200,000 pounds of lindane-treated seed are applied annually.
- There are no residential uses nor any above ground uses.
- The lindane human health and environmental risk assessments do not consider the non-FIFRA, pharmaceutical use of lindane as a prescription treatment for lice and scabies at this time.

Health Effects

- Acute dietary risk assessments are based on neurotoxic effects. Chronic dietary risk assessments are based on liver, spleen, and blood effects.
- EPA has revisited all available cancer studies including a recently submitted mouse oncogenicity study. As a result of its review under the new draft cancer guidelines, the Agency now classifies lindane in the category “Suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential.” Therefore, quantification of human cancer risk is not required.

Risks

Dietary Risks are generally not of concern

- Acute and chronic dietary exposures are well below the Agency’s level of concern for US population subgroups except as noted below.
- The chronic dietary exposures of indigenous populations that rely heavily on game generally are not of concern. Using limited data, this conservative exposure assessment suggests some risks of concern to indigenous children in one of the 180 Alaskan communities where EPA had game harvest data. In that assessment, EPA assumed children eat 1.3 pounds of predominantly whale per day.

- Data did not support the development of an acute dietary assessment for indigenous populations because the Agency does not have information on a typical day's diet. However, the Agency believes acute dietary risks are unlikely to be of concern because indigenous adults and children would have to consume more than 50 and 10 lbs of game, respectively in a single day to exceed the Agency's level of concern.

Drinking Water Risks are not of concern

- Acute and chronic concentrations in ground and surface water are not of concern based on modeling.

There are no residential uses

Aggregate Risks are generally not of concern

- Acute and chronic exposures from food and water results in risks below the Agency's level of concern, except possibly chronic exposures in one subsistence sub-population (indigenous children).

Worker Risks

- There are two worker exposure scenarios of concern: on-farm mixing/loading /application of formulations to seed, and commercial mixing/loading /application of the liquid formulation to seed at large commercial facilities.
- With respect to the proposed canola seed treatment use, four worker exposure scenarios are of concern: 1) on-farm mixing/loading/application on seeds by workers; 2) mixing/loading/application of liquid formulation for commercial seed treatment at small/medium and 3) large facilities; and 4) seed handling at large facilities.

Ecological Risks

- Based on modeling, EPA has acute and chronic risk concerns for terrestrial animals, and acute concerns for freshwater and estuarine animals.
- The Agency is uncertain about chronic risks to freshwater and estuarine animals due to a lack of data.
- Lindane is persistent and has been demonstrated to be transported atmospherically over long distances. There is uncertainty regarding ecological effects of lindane in the Arctic region.

How the Risk Picture May Change

- Several additional seed treatment studies are currently under review, that may change the occupational risk estimates. These studies evaluate worker exposures during planting treated seed, and were included in Canada's Pesticide Management Regulatory Agency (PMRA) risk assessment of lindane.

International treaties

- Lindane is included in several bilateral and multilateral treaties and agreements, including: the Great Lakes Binational Toxics Strategy; the POPs (Persistent Organochlorine Pollutants) Protocol to the Convention on Long-Range Transboundary Air Pollution (LRTAP) treaty; the Rotterdam Convention on Prior Informed Consent (PIC); and the North American Free Trade Agreement (NAFTA).
- A North American Regional Action Plan is expected to be drafted for Lindane in 2002.